



# VIEW Certified Configuration Guide

Xirrus Wi-Fi Array

XS-3500/3700/3900

June 2008 Edition 1725-36061-001 Version C

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# Introduction

Polycom's Voice Interoperability for Enterprise Wireless (VIEW) Certification Program is designed to ensure interoperability and high performance between SpectraLink Wireless Telephones and Xirrus Wi-Fi Array infrastructure products.

The products listed below have been thoroughly tested in Polycom's lab using the VIEW Certification Test Plan. This document details how to configure the XS-3500, XS-3700 and XS-3900 Wi-Fi Arrays with SpectraLink Wireless Telephones.

Manufacturer:	Xirrus, Inc <u>www.xirrus.com</u>				
Approved products:	Wi-Fi Arrays XS-3500, XS-3700, XS-3900 $^{\dagger}$				
RF technology:	802.11b/g				
Radio:	2.4 – 2.484 GHz				
Security:	WPA-PSK and WPA2-PSK				
AP firmware version certified:	3.1 - 0515				
SVP Server software version certified:	17x.027				
SpectraLink handset models certified: **	e340/h340/i640	8020/8030			
SpectraLink handset software certified:	089.127	122.010 or greater			
SpectraLink radio mode:	802.11b 802.11b				
Maximum telephone calls per AP:	12 12				
Recommended network topology:	Switched Ethernet				

## **Certified Product Summary**

<sup>†</sup> Denotes products directly used in VIEW Certification testing

\*\* SpectraLink handset models 8020/8030, e340/h340/i640 and their OEM derivates are VIEW Certified with the WLAN hardware and software identified in the table. Throughout the remainder of this document they will be referred to collectively as "SpectraLink Wireless Telephones".

### **Service Information**

If you encounter difficulties or have questions regarding the configuration process, please contact Xirrus technical support at 800-947-7871 or email us at <a href="support@xirrus.com">support@xirrus.com</a>.

### **Known Limitations**

Voice quality may be impaired in an environment with heavy wireless TCP traffic, such as FTP data transfers.

## **Access Point Capacity and Positioning**

Please refer to the Polycom <u>Deploying Enterprise-Grade Wi-Fi Telephony</u> white paper. This document covers the security, coverage, capacity and QoS considerations necessary for ensuring excellent voice quality with enterprise Wi-Fi networks.

For more detailed information on wireless LAN layout, network infrastructure, QoS, security and subnets, please see the <u>Best Practices</u> <u>Guide for Deploying SpectraLink 8020/8030 Wireless Telephones</u>. This document identifies issues and solutions based on Polycom's extensive experience in enterprise-class Wi-Fi telephony, and provides recommendations for ensuring that a network environment is adequately optimized for use with SpectraLink 8020/8030 Wireless Telephones.

# **Network Topology**

The following topology was used for VIEW Certification testing.



# **Configuration Settings**

Xirrus Arrays initially boot with all radios disabled except for the monitor radio. The monitor radio may be left enabled and in no way interferes with the SpectraLink Wireless Telephones; however it was disabled for the certification process for simplicity.

### Disabling the monitor radio

If you wish to disable the monitor radio, use the following CLI commands:

Xirrus\_WLAN\_Array# configure Xirrus\_WLAN\_Array(config)# interface iap Xirrus\_WLAN\_Array(config-iap)# abg2 down Xirrus\_WLAN\_Array(config-iap)# show

IAP Summary Table

			Cell	ТΧ	R	Х				
IAP S	State	Channel	Antenna	Size	Power	Threshold	Stations	WDS	MAC	address
a1	down	36	int-dir	manual	8dBm	-75dBm	0		00:0	)f:7d:03:63:11
a2	down	52	int-dir	manual	8dBm	-75dBm	0		00:0	)f:7d:03:63:31
a3	down	149	int-dir	manual	8dBm	-75dBm	0		00:0	Df:7d:03:63:41
a4	down	40	int-dir	manual	8dBm	-75dBm	0		00:0	)f:7d:03:63:51
a5	down	56	int-dir	manual	8dBm	-75dBm	0		00:0	)f:7d:03:63:71
a6	down	157	int-dir	manual	8dBm	-75dBm	0		00:0	)f:7d:03:62:81
a7	down	44	int-dir	manual	8dBm	-75dBm	0		00:0	)f:7d:03:62:91
a8	down	60	int-dir	manual	8dBm	-75dBm	0		00:0	)f:7d:03:62:b1
a9	down	153	int-dir	manual	8dBm	-75dBm	0		00:0	)f:7d:03:62:c1
a10	down	48	int-dir	manual	8dBm	-75dBm	0		00:0	)f:7d:03:62:d1
a11	down	64	int-dir	manual	8dBm	-75dBm	0		00:0	)f:7d:03:62:f1
a12	down	161	int-dir	manual	8dBm	-75dBm	0		00:0	)f:7d:03:63:01
abg1	down	11	int-dir	medium	11dBm	-81dBm	0		00:0	)f:7d:03:63:21
abg2	down	monitor	int-omni	manual	20dBm	-95dBm	0		00:0	)f:7d:03:63:61
abg3	down	1	int-dir	medium	11dBm	-81dBm	0		00:0	)f:7d:03:62:a1
aha/		-				04.15	•			

The monitor radio may also be disabled with the Web Management Interface (WMI) as shown below.

- **1.** In the navigation pane, click **IAP Settings**.
- 2. In the IAP Settings screen, clear the Enabled check box for IAP abg2.
- **3.** Click the **Apply** button.

rk Map	IAP	Enabled	Mode	Channel	Cell Size	Tx Power	Rx dBm	Antenna Select	Uptime - 0 days 0 hours 14 m Description
itatus	abg1		110-9-1	1 100	Max H	dBm	-90	Internal-Dir	
Config	aba2	R	V Labor	Menitor -	Manual	20	.95	Internal-Ormi	
og	abal		$\leq$	11	Max 10	20	.90	Internal-Dir	
	abol			6	Max	20	.90	Internal Dir in	
s Setun	al	m	114	N 10	Adapt in	20	50	Internal 5Ghz	
K.	12		.11a	4.3 14	Adapt Int	20	65	Internal 5Ghz	
•	a1		110	76 -	Max	20	60	Internal 5/5hz	
Server	at		11a	40 -	Adapt il	En		Internal 5Gbz	
y	a5	0	11a	40	Max	10	190	Internal 5Ghz	
	af		110	415	Max a	28	60	Informal 5Ghz	
tetting	07		110	4.4	Max 2	100	60	Internal 5Ghz	
el Settings	-1		114	40.00	Adda and	10	00	Internal 6/3hr	
E	-		110	44	1444	110	60	Internal 60hz	
(All all all all all all all all all all	410	0	114	4.4	Max III	20	45	Internal 5Ghz	
igs 11bg	111	0	110	44 10	Max. III	230	44	Internal SGhz	
fics.			110	44	at a second	200	44	Internal_SGire	
	112	U.	.118	44	Max 2	10	1.95	weine 200	
	-								Apply

Figure 1: Disabling the Monitor Radio



### **Setting Radio Channels**

With the SpectraLink Wireless Telephones operating in 802.11b mode, at least one of the Wireless LAN Array's Integrated Access Points (IAPs) must be set to the 2.4 GHz band. Any of the Array's four abg radios may be used, and up to three may be used simultaneously. However, the radios must be set to the non-overlapping channels 1, 6, and 11. This may be done using the following CLI commands:

Xirrus\_WLAN\_Array# configure
Xirrus\_WLAN\_Array(config)# interface iap
Xirrus\_WLAN\_Array(config-iap)# abg1 channel 11
Xirrus\_WLAN\_Array(config-iap)# abg3 channel 1
Xirrus\_WLAN\_Array(config-iap)# abg4 channel 6

٦

## Configuring an SSID

An SSID for the phones must be set on the Array. The following CLI commands show how to implement an SSID called 'spec'.

State	Enabled					
Active	Yes					
Encryption	None					
VLAN Name						
VLAN Number	-					
QoS Level	2					
Active Band	802.11bg	J				
Broadcast	On					
DHCP Pool	none					
Traffic Limit	Unlimite	ed				
Traffic/Station	Unlimite	ed				
Time on	Always					
Time off	Never					
Days on	AII					
	( <b>C</b> :	<i> \                     </i>				
KITTUS_WLAN_ATTAY	(config ssi	d)# chow	exit			
(irrus_WLAN_Array	(config-ssi	d)# <b>show</b>	1			
SSTD Summary Tabl	۵					
	-					
SSID Name		Active	Encryption	QoS	Band	Broadcast
				_	—	

This screen shows how to set up the SSID in the WMI.

- 1. In the navigation pane, click SSID Management.
- 2. Type the name in the New SSID Name: field near the top of the SSID Management screen.
- 3. Click the **Create** button in the upper right corner of the screen.
- 4. The name appears in the **SSID** list toward the center of the page.
- 5. Click the name and select the appropriate features below.
- 6. Be sure to click the **Enable** option on the **Broadcast SSID** line.

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S-3900 Wireless LAN Array  tas  telework Map regy Status regy Istatus	Uptime - 0 day	XiRR Choure Cambra Cre
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Infl Log dons solution press Setup twork Nices Broadcast SSID: CP Server OS Priority: CP Server CP S		Del
Idons Constantion Iguration		Del
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Inters State:		Del
State:         Enable         Disable           Nis         Broadcast SSID:         © Enable         Disable           CP Server         QoS Priority:         2		
ANS Broadcast SSID: © Enable © Disable CP Server QoS Priority: 2		
CP Server QoS Priority: 2 V		
Curly VLAN ID: (none) VLAN Number:		
Band Association: © 802.11a © 802.11b/g O Both	ř.	
Internal DHCP Pool Assigned: (NONE) -		
SID Overall Traffic Limit: Unilimited: Packets/Sec:		
Anagement Traffic Limit per Station: Unlimited: Packets/Sec:		
Day/Time Limit: Active		
Time Active: Always: D Time On: The	Time Off	
Days Active: All: Sun: Mon: Tue: Wed:	Contraction of the second	Sat:
Security Type: Open	Thu: Fri:	
	Thu: Pri:	
Security Settings: Sub Global Settings OSSID Specific Settings	Thu: Fri:	Mo
Security Settings: SSID Specific Settings	Thu: Pri:	Mo

Figure 2: Configuring an SSID

## Setting Radio Cell Size

The radio transmit powers and receive sensitivities should be set appropriately for the environment in which they are operating. The simplest way to do this is to pick an operating cell size for them. The following CLI commands illustrate how to set a small cell size on three of the abg radios.



Please see the *Xirrus Wi-Fi Array Users Guide* for a detailed explanation of radio transmit power, receive sensitivities and cell sizing.

Xirr	us_WL/	AN_Array	(config)#	interfa	ace iap	)					
Xirr	us_WL/	AN_Array	(config-ia	ap)# <b>ab</b>	gl cell	size smal	1				
Xirr	Xirrus_WLAN_Array(config-iap)# <b>abg3 cellsize small</b>										
Xirr	Xirrus_WLAN_Array(config-iap)# <b>abg4 cellsize small</b>										
Xirr	us_WL/	AN_Array	(config-ia	ap)# <b>ab</b>	gl up						
Xirr	us_WL/	AN_Array	(config-i	ap)# sho	DW						
IAP S	Summai	ry Table									
				Cell	ТΧ	RX					
IAP S	State	Channel	Antenna	Size	Power	Threshold	Stations WDS	MAC address / BSSID			
a1	down	36	int-dir	manual	8dBr	1 -75dBm	0	00:0f:7d:03:63:11			
a2	down	52	int-dir	manual	8dBn	n -75dBm	0	00:0f:7d:03:63:31			
a3	down	149	int-dir	manual	8dBn	n -75dBm	0	00:0f:7d:03:63:41			
a4	down	40	int-dir	manual	8dBn	n -75dBm	0	00:0f:7d:03:63:51			
a5	down	56	int-dir	manual	8dBn	n -75dBm	0	00:0f:7d:03:63:71			
a6	down	157	int-dir	manual	8dBn	n -75dBm	0	00:0f:7d:03:62:81			
a7	down	44	int-dir	manual	8dBn	n -75dBm	0	00:0f:7d:03:62:91			
a8	down	60	int-dir	manual	8dBn	n -75dBm	0	00:0f:7d:03:62:b1			
a9	down	153	int-dir	manual	8dBn	n −75dBm	0	00:0f:7d:03:62:c1			
a10	down	48	int-dir	manual	8dBn	n -75dBm	0	00:0f:7d:03:62:d1			
a11	down	64	int-dir	manual	8dBn	n -75dBm	0	00:0f:7d:03:62:f1			
a12	down	161	int-dir	manual	8dBn	n -75dBm	0	00:0f:7d:03:63:01			
abg1	up	11	int-dir	small	5dBn	n -75dBm	1	00:0f:7d:03:63:21			
abg2	down	monitor	int-omni	manual	20dBn	n -95dBm	0	00:0f:7d:03:63:61			
abg3	down	1	int-dir	small	5dBn	n -75dBm	0	00:0f:7d:03:62:a1			
abg4	down	6	int-dir	small	5dBn	ı −75dBm	0	00:0f:7d:03:62:e1			

This screen shows how to set the cell size and enable the radios via the **IAP Settings** page of the WMI.

- **1.** In the navigation pane, click **IAP Settings**.
- **2.** In the **IAP Settings** page, click the **Enabled** check box for each radio you wish to enable.
- 3. In the **Cell Size** column, select the desired cell size for each radio.
- **4.** Click **Apply** to initiate the changes to the Array.

LAP	Enabled	Mode	Channel	Cell Size	Tx Power	Rx dBm	Antenna Select	Uptime - 9 days 2 hours 30 Description
abg1	12	.11b/g 👻	11 🚽	Small -	5	-70	Internal-Dir 🔫	
abg2		11abg .m	Monitar	Manual	5	-95	Internal-Omni	
abg3	0	100	1	Seat -		-70	Internal-Dir	
abg4	D		6.3	Snut E	5	0	Internal-Dir	
p at		.11a	36 -	Max -	20	-90	Internal_5Ghz	
a2		.11a	52 -	Max -	20	-90	Internal_5Ghz	
a3	D	.11a	36 -	Max:	20	-90	Internal_5Ghz	
24	D	.11a	40 -	Max -	20	-90	Internal_5Ghz	
a5		.11a	56 -	Max -	20	-90	Internal_5Ghz	
A Do	0	.tta	40 -	Max	20	-90	Internal_5Ghz	
Va7	0	.11a	44.1	Max	20	-90	Internal_5Ghz	
101 a8	0	.11a	60 -	Max -	20	-90	Internal_5Ghz	
87	D	.11a	44.	Max -	2011	-90	Internal_5Ghz	
a10	D	.11a	48 -	Max	20	.90	Internal_5Ghz	
a11	B	.11a	64 -	Max -	20	-90	Internal_5Ghz	
a12	0	.11a	48 -	Max -	20	-90	Internal 5Ghz	
								Apply

Figure 3: Configuring IAPs

The SpectraLink Wireless Telephones should now be fully operational and no further changes to the Array's default settings are required. However, a few extra steps are required to enable the security features if so desired. These are explained in the following sections.

# Security

## **Enabling WPA-PSK**

For WPA-PSK mode, the global encryption cipher method must be set to TKIP with the following CLI commands:

```
Xirrus_WLAN_Array(config)# security
Xirrus_WLAN_Array(config-security)# wpa tkip on
Xirrus_WLAN_Array(config-security)# wpa aes off
Xirrus_WLAN_Array(config-security)# show
Global Security Settings Summary
_____
WEP: key 1 size : not set (default)
     key 2 size : not set
     key 3 size : not set
     key 4 size : not set
WPA:
     cipher
                : TKIP on, AES off
                       on, PSK off
     key mgmt
                : EAP
     rekey time : disabled
passphrase: not set
```

This screen shows how the global encryption cipher can be set through the WMI.

- 1. In the navigation pane, click **Global Settings**.
- 2. In the Global Settings screen, click the Yes option on the TKIP Enabled line.
- **3.** Click the **Apply** button to save the settings.

Global Settings -	Microsoft Internet Explorer		
File Edit View For	vontes Tools Help		1
Obak · O	🖹 🖬 🐔 🔎 Search 👷 Favortes 🕐 Meda 🤣 🗇 🐁 🗔	0 1 3	
Alter Alter //19	168,79,1611/miles/Andrew collectorymenes and with		- El Co. Luta * 10
	Contraction of the state of the second state of the		
XS-3900 Wire	eless LAN Array		XIRRUS
Status			Uptime - 0 days 2 hours 58 minutes
Network Man	RADIUS Server Mode:	Ointernal @External	
Array Status	WPA Settings:		
Array info	TKIP Enabled:	@Yes ON0	
Show Config	AES Enabled:	©Yes @No	
Event Log	WPA Group Rekey Time (seconds):	100000000	
Stations	PSK Authentication:	OYes @No	
Configuration			
Express Setup	WPA Preshared Key / Verify Key:		
<ul> <li>Network</li> </ul>			2
Services	EAP Authentication:	⊚Yes ⊖No	
VLANS	WEP Settings:		
DHCP Server	Key Length / Mode:	WEP-128 -	ASCI -
- Security			and a second sec
Global Settin	Encryption Key 1 / Verify Key 1:		
External Radiu	a (1) (1) (1) (1) (1) (1)		
Server			
Rener	Encryption Key 2 / Verify Key 2:		
MAC Access t	lat .		
Admin	Encryption Key 3 / Verify Key 3:		
Management	toto e teronito		
Management	and the second second second second		
Control	Encryption Key 4 / Verify Key 4:		
Rogue AP List			
SSIDs	Default Key:	Key 1 ···	
IAPS			Apply Save
WUS			
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- 1. Al			
A814 A911			
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			🔁 🐨 Internet

Figure 4: Global WPA Settings

### Setting the Pre-Shared Key

The pre-shared key must be provided next. In the example below the passphrase is set to '11111111'. The passphrase is an attribute of the SSID and is set with the following CLI commands:

```
Xirrus_WLAN_Array(config)# ssid
Xirrus_WLAN_Array(config-ssid)# edit spec
Xirrus_WLAN_Array(config-ssid-spec)# encryption wpa ssid_specific
Xirrus_WLAN_Array(config-ssid-spec)# passphrase 11111111
Xirrus_WLAN_Array(config-ssid-spec)# show
SSID "spec" Settings
_____
State
                  Enabled
Active
                  Yes
Encryption
                  SSID specific WPA
VLAN Name
VLAN Number
OoS Level
                  2
Active Band
                  802.11bg
Broadcast
                  0n
DHCP Pool
                  none
Traffic Limit
                  Unlimited
Traffic/Station
                  Unlimited
Time on
                  Always
Time off
                  Never
Days on
                  A11
Xirrus_WLAN_Array(config-ssid-spec)# exit
Xirrus_WLAN_Array(config-ssid)# show
SSID Summary Table
SSID Name
                         Active Encryption
                                               QoS Band
                                                          Broadcast
_____ ____
                                 _____
                                                    ____
                                                          _____
                                               ___
                             WPA
                                                   11bg
                      Yes
                                               2
                                                          0n
spec
```

This screen shows how to set the encryption and passphrase in the **SSID Management** page of the WMI.

- 1. In the navigation pane, click SSID Management.
- **2.** Select the correct SSID from the list at the center top of the page.
- 3. On the Security Type line, select WPA from the drop-down list.
- 4. On the Security Settings line, click the SSID Specific Settings option.
- 5. On the **PSK Authentication** line, click the **Yes** option.
- 6. Enter and verify the WPA Preshared Key.
- 7. Click the **Apply** button to initiate the changes to the Array.

SID Management	- Microsoft Internet Explorer	
Edit View Pave	orites Tools Help	
Back - O	🖻 🗟 🕼 🔎 Search 🙀 Favorites 📽 Meda 🥝 🔒	+ 毎 🕞 🔜 🕮 🖏
A https://192	160.39.161/cg-bn/VewPage.cg?location=sid_edt8id=1	- 🖸 Go 🛛 DHL *
S-3900 Wirel	less LAN Array	YIDDU
		Untime - 0 days 3 hours 20 minut
ietwork Map	New SSID Name:	Creat
vray Status vray Info show Config event Log stations	SSID:	xirrus apec (Broadcast)
nfiguration press Setup		Delet
andres	State:	Enable     Oisable
LANS	Broadcast SSID:	Enable
HCP Server	QoS Priority:	2 -
ecurity	VLAN ID:	(none) VLAN Number:
SIDs	Band Association:	© 802.11a ⊕ 802.11b/g O Both
SSID Limits	Internal DHCP Pool Assigned:	(NONE) -
SSID	Overall Traffic Limit:	Unlimited: Packets/Sec:
Management	Traffic Limit per Station:	Unlimited: 🗷 💋 Packets/Sec:
DS.	Day/Time Limit:	Active
Rers	Time Active:	Always: Ro Time On: Time Off:
iols	Days Active:	All: Mon: Tue: Wed: Thu: Fri: Sat:
agout	Security Type:	WPA -
	Security Settings:	OUse Global Settings @SSID Specific Settings
1964 AND	PSK Authentication:	Nex ONe
	WPA Preshared Key / Verify Key:	
• . •	EAP Authentication:	@Yes ONo
lical Maga: 201	RADIUS	
whing .	RADIUS Server Mode:	o Internal ⊛ External
igs:	Primary IP Address:	0.0.0
sgs: 56	Primary Port Number:	1812
	Secondary IP Address:	

Figure 5: SSID Specific WPA Settings

The Array is now configured to use WPA-PSK security for the handsets' SSID. The SpectraLink Wireless Telephones will associate to the Array once they have been programmed for WPA use with the pre-shared key.

### **Enabling WPA2-PSK**

If WPA2-PSK mode is desired then the global encryption cipher method should be set to AES with the following CLI commands:



Now provide the pre-shared key ('11111111' in this example):

<pre>Xirrus_WLAN_Array(config)# security Xirrus_WLAN_Array(config)# ssid Xirrus_WLAN_Array(config-ssid)# edit spec Xirrus_WLAN_Array(config-ssid-spec)# encryption wpa2 ssid_specific Xirrus_WLAN_Array(config-ssid-spec)# passphrase 11111111 Xirrus_WLAN_Array(config-ssid-spec)# show SSID "spec" Settings</pre>									
State	Enabled								
Active	Yes								
Encryption SSID specific WPA2									
VLAN Name									
VLAN Number	-								
QoS Level	2								
Active Band	802.11bg	I							
Broadcast	On								
DHCP Pool	none								
Traffic Limit	Unlimite	ed							
Traffic/Station	Unlimite	ed							
Time on	Always								
Time off	Never								
Days on	A11								
Xirrus_WLAN_Array(config-ssid-spec)# exit Xirrus_WLAN_Array(config-ssid)# show									
SSID Summary Table									
SSID Name		Active	Encryption	QoS	Band	Broadcast			
spec		Yes	 WPA2	2	 11bg	 On			

The global encryption cipher for WPA2-PSK can also be set through the WMI as illustrated in Figure 4 *Global WPA Settings*. The difference between the WPA-PSK and WPA2-PSK settings is that, for WPA2-PSK, **No** should be selected on the **TKIP Enabled** line, and **Yes** should be selected on the **AES Enabled** line.

Similarly, the SSID specific settings for WPA2-PSK may be applied as shown in Figure 5 *SSID Specific WPA Settings*. For **Security Type** select **WPA2** instead of WPA.

The array is now configured to use WPA2-PSK security for the handsets' SSID. The SpectraLink Wireless Telephones will associate to the array once they have been programmed for WPA2 use with the pre-shared key.